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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
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10/656,815

09/05/2003

Michael Paul Tankard

K315.130.101

9419

25281

7590

11/25/2005

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EXAMINER

NGUYEN, JIMMY

ART UNIT

PAPER NUMBER

2829

DATE MAILED: 11/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |                                       |  |
|------------------------------|--------------------------------------|---------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/656,815 | <b>Applicant(s)</b><br>TANKARD ET AL. |  |
|                              | <b>Examiner</b><br>Jimmy Nguyen      | <b>Art Unit</b><br>2829               |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2005.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1 - 23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### Response to Argument.

The argument filed 9/12/05 has been carefully considered with the following effect;

The amendments are moot of new ground of rejection.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 – 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Jitaru (US 6,380,727).

**As to claims 1, 9, 12**, Jitaru discloses (figs 4A – 4C) a switched reluctance drive with a rate of change of current sensor comprising a coil (12, 13) for coupling the flux from a conductor (8, 9) in which rate of change of current is to be sensed, the coil (12, 13) comprising a plurality of turns, each turn being a track on a printed circuit board (8, 9), each turn being displaced from its neighboring turn ( see figure 4C) in a direction parallel to the direction of the conductor.

**As to claim 2**, Jitaru discloses (figs 4A – 4C) a sensor according to claim 1 wherein the printed circuit board (8, 9) has at least a first layer (9) and a second layer (8), each turn (12) comprising a first part of the turn on the first layer (9) and a second part of the turn (13) on the second layer (8), the first (12) and second (13) parts of the turn being connected by a via (4) extending through the printed circuit board (8,9).

**As to claim 3**, Jitaru discloses (figs 3, 4A – 4C) a sensor according to claim 1 wherein the turns (12, 13) are rectangular ( see fig 3), circular or hexagonal in shape.

**As to claim 4**, Jitaru discloses (figs 4A – 4C) a sensor according to claim 1 further comprising a feature provided on the printed circuit board (8, 9) to hold the conductor ( the conductors in this case are two layers 8, 9) in place relative to the coil (12, 13).

**As to claims 5, 23**, Jitaru discloses (figs 4A – 4C) a sensor according to claim 1 a sensor according to claim 1 wherein the conductor (8, 9) is formed on or comprises a layer of the printed circuit board (8,9).

**As to claim 6**, Jitaru discloses (figs 4A – 4C) a sensor according to claim 2 wherein the conductor (8, 9) is a split ( the conductors 8, 9 have window 7 that split into two) conductor having at least two limbs each of which runs close to vias of either side of the coil (8,9).

**As to claim 7**, Jitaru discloses (figs 4A – 4C) a sensor according to claim 1, wherein at least two coils (two different portions of coil (12, 13) are provided on the pcb, the conductor extending between the two coils.

**As to claim 8**, Jitaru discloses (figs 4A – 4C) a sensor according to claim 1 wherein each turns of the coil (12, 13) is of the same dimension as the other turns.

**As to claim 13**, Jitaru discloses (figs 4A – 4C) a switched reluctance drive as claimed in claim 12 wherein the means for coupling comprises a coil (12, 13)

**As to claims 10, 14**, Jitaru discloses (fig 15) a switched reluctance drive as claimed in claim 9 wherein the output of the sensor (25) is fed to a circuit which detects (V) the point at which the rate of change of current crosses zero (column 5 line 47 – 58).

**As to claims 11, 15**, Jitaru discloses (fig 15) a switched reluctance drive as claimed in claim 10, wherein the output of the sensor is used to provided rotor position information.

**As to claim 16**, Jitaru discloses (figs 4A – 4C) each turn is a single wine of coil (12, 13).

**As to claim 17,** Jitaru discloses (figs 4A – 4C) a sensor according to claim 16 wherein the printed circuit board has at least a first layer ( 9) and a second layer (8), further wherein only half of each wind (12) is on the first layer (9) and only half of each wind (13) is on the second layer (13), such that the first layer (9) includes a plurality of half winds (12) and the second layer (8) includes a plurality of half-winds (13).

**As to claims 18, 21, 22,** Jitaru discloses (figs 4A – 4C) a sensor according to claim 1 wherein the conductor (8, 9) defines an axis along which current in the conductor flows, the sensor further comprising a plurality of said vias (4) extending through the printed circuit board (8, 9), said plurality of vias as viewed in cross section together a line of vias extending in a direction parallel to said axis.

**As to claim 19,** Jitaru discloses (figs 4A – 4C) a sensor according to claim 18 wherein the plurality of vias (4) as viewed in cross section together form a pair of lines of vias, each line of vias extending in a direction parallel to said axis.

**As to claim 20,** Jitaru discloses (figs 4A – 4C) a sensor according to claim 1 wherein each turn forms a staggered overlap with adjacent turns of the coil.


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Nguyen whose telephone number is 571-272-1965. The examiner can normally be reached on M-F from 9 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ramtez Nestor, can be reached on 571-272-2034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JN.  
Nov 18, 2005

  
VINH NGUYEN  
PRIMARY EXAMINER  
A.U. 2829  
11/22/05